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Little difference appeared in the rapidity of germination (germinative energy) of the two lots in question, the seed requiring about 8-10 weeks under the better conditions. High temperatures hastened germination, and low ones retarded it, while the final percentages were lowered by both. Alternating temperatures, with a range of 15° - 35° C. (59° - 95° F.) or less, simulating the daily fluctuation in nature, proved most efficient in the class of pines possessing the habit of persistence of cones. Of stationary temperatures 35° C. was found to be the best. Although of the six species tested that belong to this class of pines the northern jack pine (*P. divaricata*) is the only one that germinates equally well at low temperatures, few show a decided lowering of their record by high temperatures. The shore pine (*P. contorta*), probably from California, actually made its best record at a temperature of 20° - 50° C. (68° - 122° F.). If nothing more, this at least indicates that the seeds are able to withstand with little injury a rather high degree of dry heat incident to the fires that open the cones.

Adding an observation on other pine seeds it may be noted that no such deterioration appeared in *P. ponderosa* and its variety *scopulorum* in 18 months as Professor Coker finds for *P. palustris*. Two tests of the first-named pine six months old germinated 68 and 85 per cent. respectively, while four tests 18 months old produced 64, 70, 71, and 85 per cent. of sprouts. The cause for the difference may be partly a matter of storage conditions, and partly an inherent tendency of the species bred by its native climate. In other words, the perishable character of the seed of *P. palustris* may be due, wholly or in part, to the warm and humid climate where the species is indigenous.

REVIEWS.

Macdonald's Dry Farming*

This neatly-bound book with nearly forty photographs illustrating various phases and processes of farming begins with a history of dry farming, which the author claims "has been

* Macdonald, William. Dry-Farming: Its Principles and Practice. Pp. 290. Pl. 37. The Century Co., New York. 1909.

practiced since the dawn of civilization in Mesopotamia, in Egypt, and in northwestern India." Jethro Tull, who in 1731 published an "agricultural classic" on the "new horse-hoeing husbandry" is called the father of the new method, although his theory, that "tillage is manure" is not, of course, accepted now.

The book describes clearly dry farming as it is followed in various parts of the United States, with rules for successful practice, results that may be expected, and modifications in methods and results based upon the kind of soil, the depth of the water table, the size of the farm, and the climatic belt in which the farm is situated. The effects of different tools and implements used in tillage and the seasonal phases of dry-farming are also included. The book is elementary and simple enough for a high school boy, and yet wholly readable to any older person who thinks of dry-farming vaguely as a sudden and mysterious discovery of the "Golden West" which enables farmers to raise plants without water.

JEAN BROADHURST

FIELD MEETINGS FOR 1910

The meetings for May are published in the Bulletin of the Academy of Sciences.

June 4.—New Rochelle, N. Y. Train leaves 129th Street and Third Avenue (N. Y., New Haven, and Hartford R. R., Harlem River branch) at 12.20 P. M. Returning trains leave at 4.00 and 5.00 P. M. Cost of trip about 25 cents. Guide, Miss Levy, who will meet the party at New Rochelle.

June 11.—West Englewood, N. J. Train leaves foot West 42nd Street (West Shore R. R.) at 1.15 P. M. A special study of swamp ferns will be conducted by the guide, Dr. Dowell, who will meet party at West Englewood. Buy return ticket. Cost of trip about 45 cents.

June 18.—Moonachie, N. J. Party will meet at the Rutherford Trolley, Hoboken, N. J., at 1.30 P. M., where they will be met by the guide, Mr. G. V. Nash.

June 25.—Springfield, L. I. A special study of the relation of insects to plants. Train leaves foot east 34th Street (Long Island R. R.) at 1.10 P. M. Returning trains leave at 4.46 and 5.45 P. M. Cost of trip about 70 cents. Guide, Dr. Southwick.